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Karakterisasi Morfologi Bunga dan Buah Abnormal Kelapa Sawit (Elaeis guineensis Jacq) Hasil Kultur Jaringan[1)]

Characterization of Abnormal Flower and Fruit Morphology of Oil Palm (Elaeis guineensis, Jacq) Tissue Culture-Derived Plants

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ABSTRACT

Tissue culture-derived plants of oil palm (Elaeis guineensis Jacq) can produce abnormal female dan male flowers, especially female, which develop into mantled fruit. This abnormality have caused yield lost up to 40%. The objectives of this research were to study the stages of flower development in which the abnormality started to appear, to characterize the morphology of the abnormal flower and fruit, and to determine the degree of abnormality. Plant materials used in this research were MK152, MK 176, MK 203, MK163, MK104, MK 212 and MK 209 clones obtained from the collection of "Badan Pengkajian dan Penerapan Teknologi (BPPT)" in Ciampea, Bogor. Characterization of abnormality at the flowering stage was conducted based on morphological performance at several stages of flower development, while the degree of abnormality at fruiting stage was determined based on the condition of carpel, mesocarp and seed. Normal flower and fruit of the same clone were used as the control. The results showed that the abnormality started at primordial stage of flower organ formation. Supplement carpel was found surrounding gynoecium for the abnormal female flower, which was composed of three to six carpels present at separate whorl of flower. Abnormal male flower had no additional whorl of flower, instead stamens were converted into carpel-like structures. In this case, number of carpels structure depends on the degree of abnormality. There were three levels of abnormality, i.e. light abnormality (AbR), heavy abnormality (AbB) and severe abnormality (AbSB). The severe abnormal fruit was seedless, with soft mesocarp (AbSB1) and woody mesocarp (AbSB2).

Key words : oil palm, mantled fruit, supplement carpel, flower whorl, tissue culture

PENDAHULUAN

Kelapa sawit merupakan tanaman yang menyerbuk silang sehingga benih yang dihasilkan tidak seragam sifatnya dan sifat unggul tidak dapat dipertahankan. Oleh karena itu untuk memenuhi kebutuhan bibit unggul maka varietas hibrida Tenera diperbanyak melalui kultur jaringan. Kelapa sawit hasil perbanyakan kultur jaringan seringkali menghasilkan bunga dan buah yang abnormal, berbeda dengan tanaman dari benih. Tanaman yang berasal dari benih sering terjadi abnormalitas saat mulai berbunga, namun menjadi stabil berbunga dan berbuah normal pada umur 2.5 tahun (Lubis, 1992). Pemanfaatan teknik kultur jaringan untuk perbanyakan kelapa sawit dalam skala besar dihambat oleh adanya fenotip buah bersayap kira-kira 5.69% pada klon PPKS (Fatmawati et al., 1997) atau 5-10% pada semua klon yang diregenerasi (Corley et al., 1986 ; Tregear et al., 2002). Menurut Toruan-Mathius et al. (2001) terjadi abnormalitas pada organ reproduktif berkisar 10-40%, yang menurut Eeuwens et al. (2002) menyebabkan produktivitas menurun karena buah yang terbentuk biasanya gugur selama dalam perkembangan.

Menurut Tandon et al. (2001) pistil kelapa sawit mempunyai stigma berbentuk tiga cuping (trilobe) yang membentuk tiga lokul pada dasar ovari. Pada tiap lokul terdapat satu ovul sehingga pistil kelapa sawit dikatakan sebagai ginoesium dengan tiga karpel. Sedangkan bunga jantan mempunyai enam atau tujuh stamen (Hartley, 1977), tiap rangkaian bunga jantan menghasilkan serbuk

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